REMARKS:

Reconsideration of the subject patent application, as amended, is respectfully requested.

Claim 30 is amended herein. Claim 61 has been allowed over the prior art and Claims 5, 7, 10-14, 18-21, 24, 25, 36-45, 49-54, 56, and 57 stand objected to but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Claims 1-4, 15-17, 22, 23, 26-35, 46-48, 55 and 58-60 stand rejected under 35 U.S.C. §102(b) over Antonioli et al., U.S. Patent No. 5,773,716. Claim 1, 2, 6, 8, 9 and 15 stand rejected under obviousness-type double patenting as being unpatentable over Claim 6 of Benson et al., U.S. Patent No. 6,823,834. For at least the following reasons, Applicants traverse these rejections:

Applicants' independent Claims 1 and 30 are directed to a system for estimating parasitic fuel leakage from a fuel injection system, wherein "parasitic leakage" is defined by each of Claims 1 and 30 as "corresponding to a leakage of fuel from the fuel injection system when no fuel is being supplied to, or drawn from, the fuel injection system". Some of the method steps of Applicants' Claim 30 are amended herein to more distinctly claim the specific condition that measurements for determining fuel leakage are taken when the fuel injection system is hydraulically locked.

In contrast, nowhere does Antonioli et al. disclose the measurements for determining a fuel leak be made upon a specific condition, as required by Applicant's claimed invention, i.e., no fuel being supplied to or drawn from the fuel injection system. Rather, Antonioli et al. describes a system that first determines whether a fuel leak exists, and then second, if a fuel leak exists at all, diagnosing whether the fuel leak is due to a jammed-open fuel injector or a failure in the fuel supply circuit, such as a crack or failure of parts of the supply circuit (col. 4, lines 39-43; col. 1, lines 25-28).

Antonioli et al. discloses two embodiments for determining whether a fuel leak exists. The first embodiment described by Antonioli et al. compares a fuel rail pressure signal with a reference pressure value to determine whether a fuel leak exists (col. 3, lines 34-37). No condition under which the measurements or determination are made is disclosed. Specifically, Antonioli does not disclose conducting the fuel leak test in only when no fuel is being supplied to, or drawn from, the fuel injection system, as required by Applicant's Claims 1 and 30. The second embodiment of Antonioli et al. requires measurement of the fuel consumption in determining a fuel leak condition (col. 4, lines 8-10), which is not pertinent to Applicant's claimed invention.

From the foregoing, it should be apparent that Antonioli et al. does not disclose the recitations of Applicant's independent Claims 1 and 30. Claims 2-29 ultimately depend from Claim 1 and claims 31-60 ultimately depend from Claim 30, and these claims are believed to be patentably distinct from Antonioli et al. for at least the reasons state hereinabove.

Regarding the rejection of Claims 1, 2, 6, 8 and 15 in view of Claim 6 of Benson et al., U.S. Patent No. 6,823,834 under obviousness-type double patenting, Applicants believe the claims are patentably distinct from Claim 6 of Benson '834.

While Benson '834 discloses a fuel injection control system 50 related in structure to the present application, the estimation of parasitic flow leakage value as called for by Claim 6 of Benson '834 does not make obvious any claims of the present application. Benson et al. '834 discloses and claims measuring a first and second fuel pressure corresponding to a system operation period that includes fuel injection (fuel drawn from the fuel injection system). Specifically, Claim 1 of Benson '834, from which Claim 6 depends, calls for determining a first pressure in the fuel collection unit following disablement of the fuel pump and prior to fuel injection, and determining a second pressure in the fuel collection unit after the fuel injection and prior to resuming pumping of the fuel by the fuel pump, and the control circuit configured to estimate a parasitic flow leakage value as a function of the first and second pressures and of the engine temperature signal. Thus the sequence of fuel pump system operations during which the first and second pressures are measured is: 1) disable fuel pump, 2) measure first pressure, 3) inject fuel, 4) measure second pressure, and 5) enable fuel pump.

In contrast, Applicants' Claim 1 and Claims 2, 6, 8, 9 and 15 require that an estimate of a quantity of parasitic fuel leakage as a function of the pressure signal corresponding to when no fuel is being supplied to or drawn from the fuel injection

system, as discussed above. Therefore, Applicants' claims are patentably distinct and non-obvious over Claim 6 of Benson et al. ' 834.

Applicants have traversed all claim rejections and objections, and Claims 1-60 are believed to be in condition for allowance. The Examiner is cordially invited to contact the undersigned by telephone to discuss any unresolved matters.

Respectfully submitted,

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